CAMBRIDGE SYSTEMATICS

2040 Statewide Transportation Plan / 2015 Statewide Strategic Transportation Plan: Development of Study Methodology

Technical Memorandum 1A

final technical

memorandum

prepared for

Georgia Department of Transportation

prepared by

Cambridge Systematics, Inc.

with

Geostats, LP
Gresham, Smith, and Partners
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1.0 Task I – Document Review

The following documents will be reviewed and documented in a separate Literature Review Technical Memorandum under this task. This review will focus on the following elements:

- Date of publication;
- Policy and major conclusions;
- Data and tools;
- Analysis; and
- Applicability to the SWTP/SSTP.

Documents to be reviewed include the following:

- 2010-2030 Georgia Statewide Strategic Transportation Plan;
- Statewide Strategic Plan Progress Report, February, 2012;
- 2005-2035 Georgia Statewide Transportation Plan;
- Georgia Statewide Freight and Logistics Plan;
- 2011 Georgia Statewide Airport Economic Impact Study;
- Southwest Georgia Interstate Study;
- Managed-Lane System Plan and Updates;
- Georgia Interstate Risk Assessment Study;
- Metro Atlanta Operations Plan;
- I-75 North and South;
- Athens to Atlanta;
- SR 21;
- Rural Human Services Transportation Plan;
- GRTA Human Services Transportation Plan;
- Georgia Truck Lane Needs Identification Study;
- Connect Central Georgia;
- Economic Impact and Benefit Studies;
- Georgia Asset Management Implementation Plan;
- High-Speed Rail Plans;
- Governor's Strategic Goals;
- I-285 Strategic Plan and Revive I-285;
- Atlanta Strategic Thoroughfare Plan;

- Project Prioritization Process;
- Atlanta Radials Strategic Plan;
- All MPO LRTPs; and
- All MPO Freight Plans.

Document the current requirements for statewide planning documents as specified in:

- Georgia laws and regulations; and
- Federal MAP-21 legislation.

2.0 Task II – Data Collection

This task will involve collecting all of the data needed to prepare an assessment of the existing conditions and performance of the transportation system in Georgia, and to forecast those conditions and performance into the future. It is expected that this effort will primarily rely on existing data that is collected and maintained by GDOT and other agencies, and, as has been done on numerous past efforts, to develop linkages between these databases, such that a comprehensive assessment can be developed. Where necessary, if gaps are found when examining and compiling existing data, a limited amount of new data collection may be undertaken.

2.1 Highway

GDOT maintains an extensive data inventory of the highways in Georgia, both those owned by the State and those owned by others. Almost all of that data can, and has in the past, been joined by GIS using the Road Characteristic Link identifiers which are included in almost all GDOT datasets. The use of this identifier makes it possible to link all of these databases. Additionally, other databases, available from other agencies, can be linked to this Road Centerline GIS database using the locational information in those databases. The databases that we have collected and examined in the past and have already collected, are shown in Table 1 and are described in the text following that table.

Table 1. Highway Databases

Databases Already Collected	Current Years
GDOT Road Centerline GIS database	2011
HPMS	2010
GDOT Bridge	2012
NBI Bridge	2012
NTAD	2012
Historic Sites	2007
RC/FRED	2012
Crash	2007-2011
TPro	No Master Dataset
Protected lands	2011
Land Cover (wetlands)	2010
Flood zone	2012
River reach (protected streams)	2012
Boundaries	2012
Census/CTPP	2010
Economic (DCA)	Varies, Current
Traffic Counts	2009-2010

- **GDOT Statewide Road Centerline GIS Database – The primary roadway centerline GIS database.** These files can be used to map all of the roads in Georgia. They contain Road Characteristic Link (RCLINK) identifier numbers, and are a LRS measured shapefile that can be used to join, maintain, and display other GDOT data.

- **FRED/RC –** The Federated Road Enhanced Database (FRED) houses the Road Characteristics (RC) file. The RC file is GDOT's complete database inventory of all roads in Georgia. It includes information on administrative characteristics of roads (e.g., ownership, functional classification), physical characteristics (e.g., lane width, pavement type), operational characteristics (e.g., speed limits, turning lanes), infrastructure condition (e.g., PACES – Pavement Condition Evaluation System), and usage (e.g., AADT – Average Annualized Daily Traffic). The RC file includes a Linear Referencing System (LRS) ID, the RCLINK number. Together with the beginning and ending milepost attributes, each RC segment is uniquely identified, and can be combined with other databases that use the same LRS/RCLINK system. The RCLINK also can be combined with geographic files of roads which allows maps to be created of any attributes.

- **HPMS –** The Highway Performance Monitoring System (HPMS) is a continuous data collection system. Currently, the HPMS nationwide database contains over 110,000 highway sample segments, the most comprehensive nationwide data system in use regarding the physical condition and usage of the Nation's infrastructure. The HPMS database is the primary source of information for the Federal government about the Nation's highway system. GDOT prepares the submittal of the HPMS database for Georgia's roads.

- **GDOT Bridge Inventory System –** The Bridge Inventory System is maintained by GDOT's Bridge Management Unit (BMU) and provides an inventory of all data on bridge elements for all bridges in Georgia, and documents their current condition as determined by the inspections conducted by the BMU.

- **NBI Bridges –** The National Bridge Inventory (NBI) is a database, compiled by the Federal Highway Administration, with information on all bridges and tunnels in the U.S. that have roads passing above or below. It is based on the data submitted by GDOT, as developed from its own Bridge Inventory System, in a consistent format with information submitted by the other states.

- **COPACES –** Computerized Pavement Condition Evaluation Systems (COPACES) is a database, maintained by GDOT's Pavement Management Unit, that contains the elements of the road pavement and its current conditions based on pavement inspections. It is utilized and processed by GDOT's Office of Transportation Data, by location, into the International Roughness Index (IRI) and Present Serviceability Rating (PSR) systems that are required by FHWA's HPMS.

- **NTAD –** The National Transportation Atlas Database (NTAD) is a collection of geospatial databases developed by the U.S. Department of Transportation and other Federal agencies depicting transportation facilities, networks, and services of national

significance. In this project, it is expected to be a primary source for the location of ports, airports, intermodal connectors, railroad crossings, etc., to supplement the other highway transportation data.

- **GDOT Crash Database –** The Crash Analysis and Statistics Information database is prepared from accident reports merged with GDOT's Location File. The Location File is a separate file that is used to verify the crash location given by the law enforcement office and contains extensive detailed information on the road. This database will be utilized in a manner consistent with Georgia's Strategic Highway Safety Plan (2011) to identify road infrastructure-related traffic crashes.

- **TPro –** The Transportation Projects system is a comprehensive relational database which maintains all of the administrative, engineering, and financial information of projects for which any planning, design, or construction work is anticipated. It is used to develop GDOT's ten-year Construction Work Program (CWP) and four-year State Transportation Improvement Program (STIP). While TPro contains an estimated schedule of dates for project lettings (not all of which will be realized), the type of work to be accomplished by each project does not change substantially over time. TPro contains some sensitive information which will not be needed in the preparation of this Plan. Additionally, TPro is constantly being updated and maintained by GDOT, such that having direct access to TPro is neither feasible nor desirable. The information from TPro will only be relevant when alternatives and projects are being tested in Task V. A current extract of TPro will be obtained from GDOT at a date close to the start of Task V – Systemwide Evaluation of Deficiencies.

- **Traffic Counts –** While most traffic count information is stored in the RC or HPMS files, additional information, such as the raw counts, ramp counts, vehicle classification counts, weigh and motion counts, etc., is maintained by GDOT's Office of Transportation Data. This data may take the form of Excel files or other information.

- **Statewide and MPO Models –** As described in more detail in Task III, the MPO regional models and GDOT's Statewide Model (SWM) will be used.

- **Transit –** The GDOT Intermodal office maintains transit information, including that reported in the Transit Fact Book. Of interest to the Highway system are the bus routes operated by Georgia's Regional Transit Authorities that use Georgia's roads. We have access to older information that is available from FTA on the locations of bus routes, in the form of shapefiles. This information will be updated based on GDOT records to indicate which roads are used by fixed route bus transit vehicles.

In addition to highway-specific data, data on underlying environmental conditions will be important to supporting the highway (and possibly other modal) analyses, including the following:

- **Historic Resources Survey/GNAHRGIS –** A survey maintained by the Georgia Department of Natural Resources, Historic Preservation Division, includes an architectural description of the building, photographs, and field notes on its age, history, setting, and geographical location. The survey data is entered into an on-line database known as GNAHRGIS – Georgia's Natural, Archaeological, and Historic Resources Geographic Information System.

- **Protected Lands –** Section 4(f) of the original section within the U.S. Department of Transportation Act of 1966, now codified in 49 U.S.C. §303 and 23 U.S.C. §138, requires the consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development.

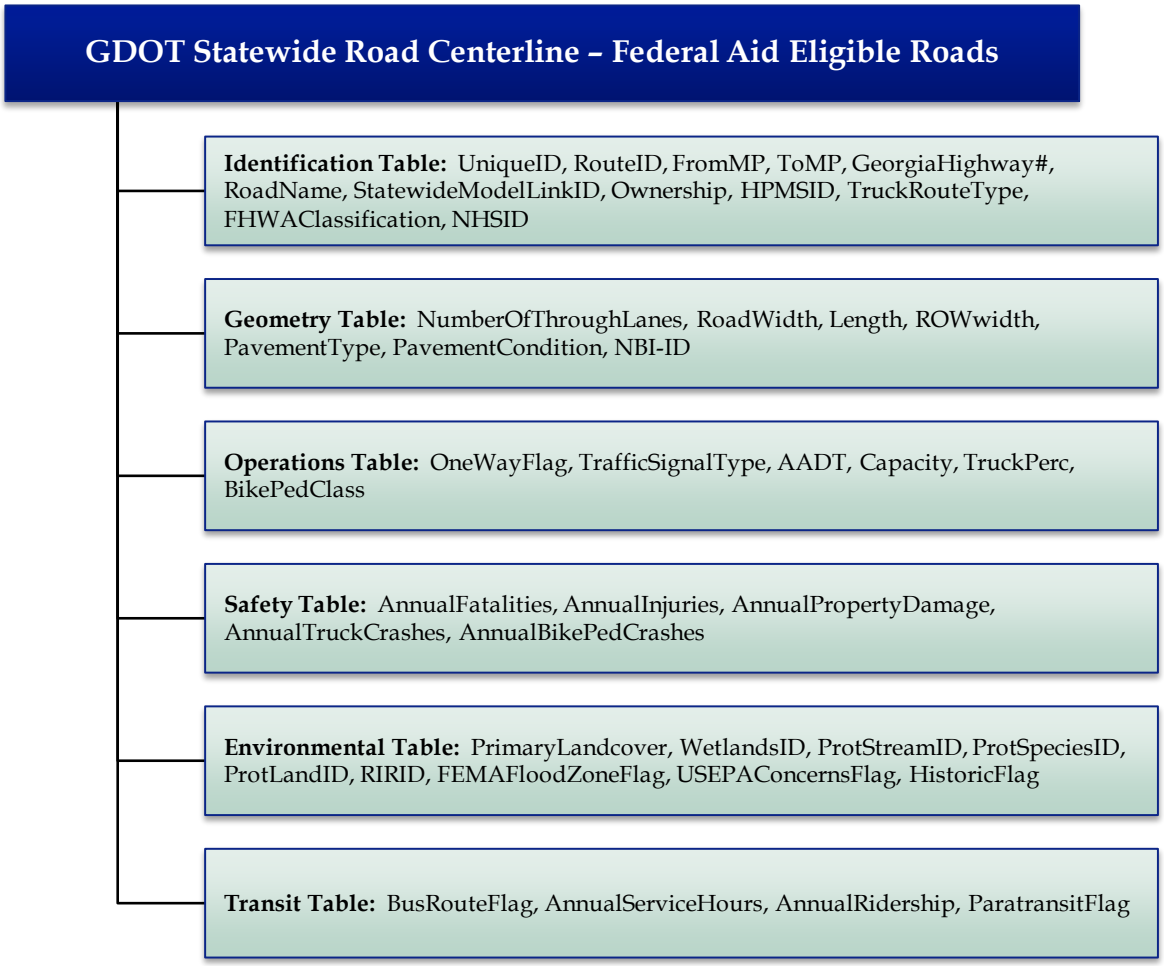
- **Land Cover –** The Georgia Department of Community Affairs maintains a Land Use shapefile based on the filings of community comprehensive land use plans.

- **Flood Zone –** The State of Georgia Department of Natural Resources, Environmental Protection Division, as part of an agreement with the Federal Emergency Management Agency (FEMA), assumed responsibility for the development and updating of the flood hazard maps (known as Flood Insurance Rate Maps, or Firms) on a countywide basis for all 159 counties in the State.

- **Rivers (Protected Streams) –** Under the Georgia River Basin Management Planning Act, the Georgia Department of Natural Resources, Environmental Protection division, provides the framework for identifying, assessing, and prioritizing water resource issues, developing implementation strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply.

We propose to link this data, using the GDOT Statewide Road Centerline GIS files, as shown in Figure 1 on page 7, into databases by functional areas such as identification, geometry, operations, safety, environmental, and transit. This comprehensive framework will support the planning and analysis effort that will be undertaken in the later Tasks.

Figure 1. Framework of Comprehensive Highway Databases



2.2 Transit

A Geographic Information System (GIS) database will be developed for all transit systems within the State, including service areas for rural, on-demand services. The statewide transit GIS will include geocoded route lines for all fixed route transit systems. For fixed routes segments along Federal Aid eligible roads, the following transit operational data will be incorporated into the GIS (if available):

- Service days per week;
- Service hours per week;
- Fare amount; and
- Estimated ridership.

Polygons will also be developed within the statewide transit GIS for all paratransit service areas. Summary tables, including ridership data and corresponding service hour data, will also be developed.

Additional data sources will include Transit Development Plans (TDP) and Coordinated Public Transit-Human Services Transportation Plans for all transit agencies within the State, GDOT's Office of Intermodal Programs most recent *2007-2011 Georgia Transit Programs Fact Book*, the transit element of each Metropolitan Planning Organization (MPO) Long-Range Transportation Plans (LRTP), and other local, regional, and statewide transit system summaries. The National Transit Database (NTD) will also be utilized for detailed operational and performance data for Federal Transit Administration (FTA) Section 5307 programs.

2.3 Air

A GIS database will be developed for all 103 public airports within the State, using already existing data from GDOT Intermodal and the Federal Aviation Administration (FAA). Depending upon size, airport locations will be represented by either points or polygons within the database. Other sources of airport data will include GDOT's *2011 Georgia Statewide Airport Economic Impact Study*, and other available information, including Master Plans and five-year Capital Improvement Programs (CIP) developed by each airport. Airport CIPs are elements of the Master Plan, like TIPs are components of MPO LRTPs. A master plan update for Hartsfield-Jackson International Airport was initiated in fall 2012 and is scheduled for completion in 2013.

2.4 Rail

Primary data on rail traffic will come from the Surface Transportation Board's (STB) Confidential Carload Waybill Sample for the year 2011. The Waybill Sample provides a detailed record of freight rail shipments, using a stratified sampling method. In addition, given the current and future importance of rail/highway intermodal traffic, we will work with Norfolk Southern (NS) and CSX railroads to collect truck origin-destination data for trucks moving into and out of the four major intermodal rail yards in the Atlanta region (Hulsey, Inman, Fairburn, and Austell). The team will conduct a one- or two-day survey at the rail yard gates. The data collected through this effort will provide information on catchment areas for each of the intermodal rail yards, routes used to connect to the larger Atlanta road network, and more generally the importance of intermodal rail to the State's economy.

For Passenger rail traffic, the team will rely on several sources. For intercity rail, the team will primarily utilize Amtrak data on on-time performance, financial results, reported ridership by origin-destination for 2011 and 2012, and the long-distance route improvement studies that were mandated under the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). At this time, there is no regional rail service. However, extensive studies have been conducted in recent years by various agencies and groups, which will be reviewed.

2.5 Water

The team will obtain current water cargo data from the Georgia Ports Authority (GPA). We will work with the GPA to conduct a two-day truck origin-destination survey at the major port gates at the Port of Savannah. This survey will be an update to a similar survey conducted in 2005 as part of the GDOT Truck Lane Needs Identification Study. The data collected through this new effort will be used to identify major roadways used by port truck traffic, determine the share of truck traffic that flows through local Savannah warehouses, and estimate the impact of alternative development patterns in the port subarea which will generate different roadway transportation needs for the region.

2.6 Freight

Apart from the rail data discussed previously, data for motor carrier and water shipments will be drawn from the 2007 Georgia TRANSEARCH database which was used in GDOT's 2011 Freight and Logistics Plan (F&L). Although this dataset is somewhat aged at this point, there is no publicly available data of more recent vintage. Freight volumes will be forecasted by applying the forecast incorporated into the FHWA's Freight Analysis Framework (FAF) Version 3.4 onto the TRANSEARCH database that is licensed by Georgia DOT. This most recent update of the FAF contains a forecast that dates from mid-2012, and thus fully reflects the impacts of the Recession and subsequent economic developments.

2.7 Bicycle/Pedestrian

A GIS database will be developed for all designated bicycle and/or multipurpose facilities along all Federal Aid roads within the State. The database will be distinguished by type of facility: grade-separated bike lane, striped bike lane (including "sharrows" or shared-lanes), or a designated bike route only. Other data sources will include stand-alone bicycle/ pedestrian plans (as available) from MPOs or Regional Commissions (RC), or bicycle elements from MPO Long-Range Transportation Plans (LRTP). Data from the 2010 U.S. Census will also be obtained for information regarding walking and/or bike commute trip information. Statewide sources, including GDOT's *Georgia Bicycle and Pedestrian Safety Action Plan* and *2010 Georgia Bicycle Map*, will also be incorporated into the plan update.

3.0 Task III – Existing Transportation Systems Conditions Evaluation

Using the data collected in Task II, we will provide an inventory of each mode of transportation in the State, taking into account each MPO's LRTP and existing systems, and current modal plans as maintained by GDOT's Division of Intermodal. This inventory will include physical assets and conditions and baseline performance data.

3.1 Highways

GDOT's Project Prioritization Process (PrPP) evaluates projects using performance measures that are consistent with the goals of the SWTP/SSTP. These performance measures and their goals are:

- **Preservation Measures**
  - Bridge Structural Deficiency
  - PACES Rating
- **Safety Measure**
  - Crash Reduction
- **Congestion Measures**
  - Delay Reduction
- **Connectivity, Access, and Mobility Performance Measures**
  - Change in Travel Time on a Non-Interstate Truck Route, an NHS Intermodal Connector, and/or the STRAHNET
  - Activity Centers
  - Land Use Plan
  - Access Management
- **Economic Development Measures**
  - Change in Gross State Product (GSP)
  - Economic Development Policy Area

In the PrPP, these performance measures are weighted by a score assigned to each project based on its location in three different regions: the Atlanta Region; all other Georgia MPOs; and Rural Georgia. Many of these measures are scored based on the relative difference between No Build and Build measures for that project, e.g., Crash reduction, in order to maintain consistency between the SWTP/SSTP and the PrPP. The team will modify this process to calculate the absolute values by road segment, for example, the absolute, not the change, in the number of crashes per mile, and to aggregate the roads by system and region, in order that the relative deficiencies can be scored, weighted, and ranked.

Also to maintain consistency with the PrPP, the team will utilize most of the methods used in the PrPP to calculate these performance measures. For example, the Bridge Structural Deficiencies will be calculated using the NBI/Bridge Inventory System reported structural deficiency and pavement preservation will be evaluated using PACES. These measures are only a means to evaluate roads, and do not themselves establish the existence of deficiencies. We will work with GDOT to determine the thresholds at which a deficiency is assumed to exist – for example, congested LOS, bridge structural deficiency, or PACES rating.

The PrPP provides a methodology for evaluating three types of highway projects – capacity expansion, traffic operations, and GRIP. Most highway elements, which will be considered at the individual project or programmatic level in the SWTP/SSTP, will fall into one of these three categories.

The team will use the metrics and methodologies developed in the PrPP as the basis for evaluating existing and future conditions on the roadway system, but **not** to rank individual projects unless GDOT requests that we do so in determining which megaprojects to include in the plan.

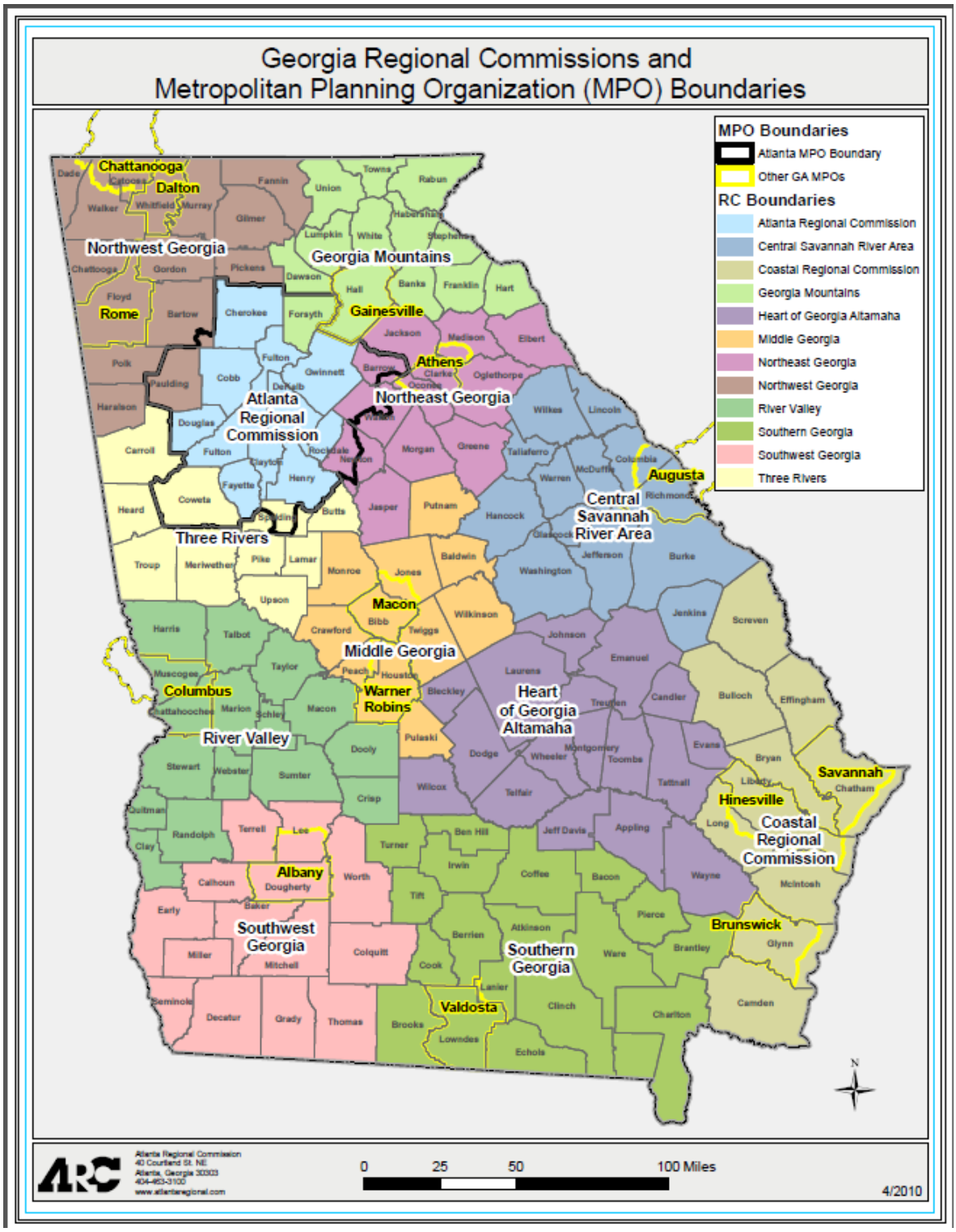
The evaluation, ranking, and reporting of deficiencies of each roadway segment in Georgia will produce an unmanageable amount of data. The team will work with GDOT to aggregate road segments into useful combinations of roads by facility type and region.

Unlike the above measures, congestion measures will be evaluated using the statewide and MPO travel demand models. Additionally, the volumes reported by the travel demand models will be used in lieu of any of the volumes reported in other databases, such as the HPMS or RC databases. The modeling approach intended to be used for this plan is based on a similar approach to that used in the Connect Central Georgia study along the Columbus–Macon–Augusta transportation corridor. That study covered a multicounty region and included existing and proposed corridors connecting the Columbus, Macon, Warner Robins, and Augusta MPOs. While important segments of the CCG corridor study area lie within those four MPO areas, the larger geographic land area within the study boundary is located in rural parts of Central Georgia that are not covered by MPO models. This necessitated reliance on Georgia's statewide travel demand forecasting model (SWM) in conjunction with MPO models for urbanized corridor segments.

Georgia is a large state, being biggest in land area east of the Mississippi River. This size necessitates a similar approach as that taken for the CCG study where the segments in the rural areas not covered by MPO models are addressed using the SWM. The SWM covers the entire area of the State in addition to providing some transportation detail in immediately surrounding states, particularly with regard to freight travel to and from Georgia.

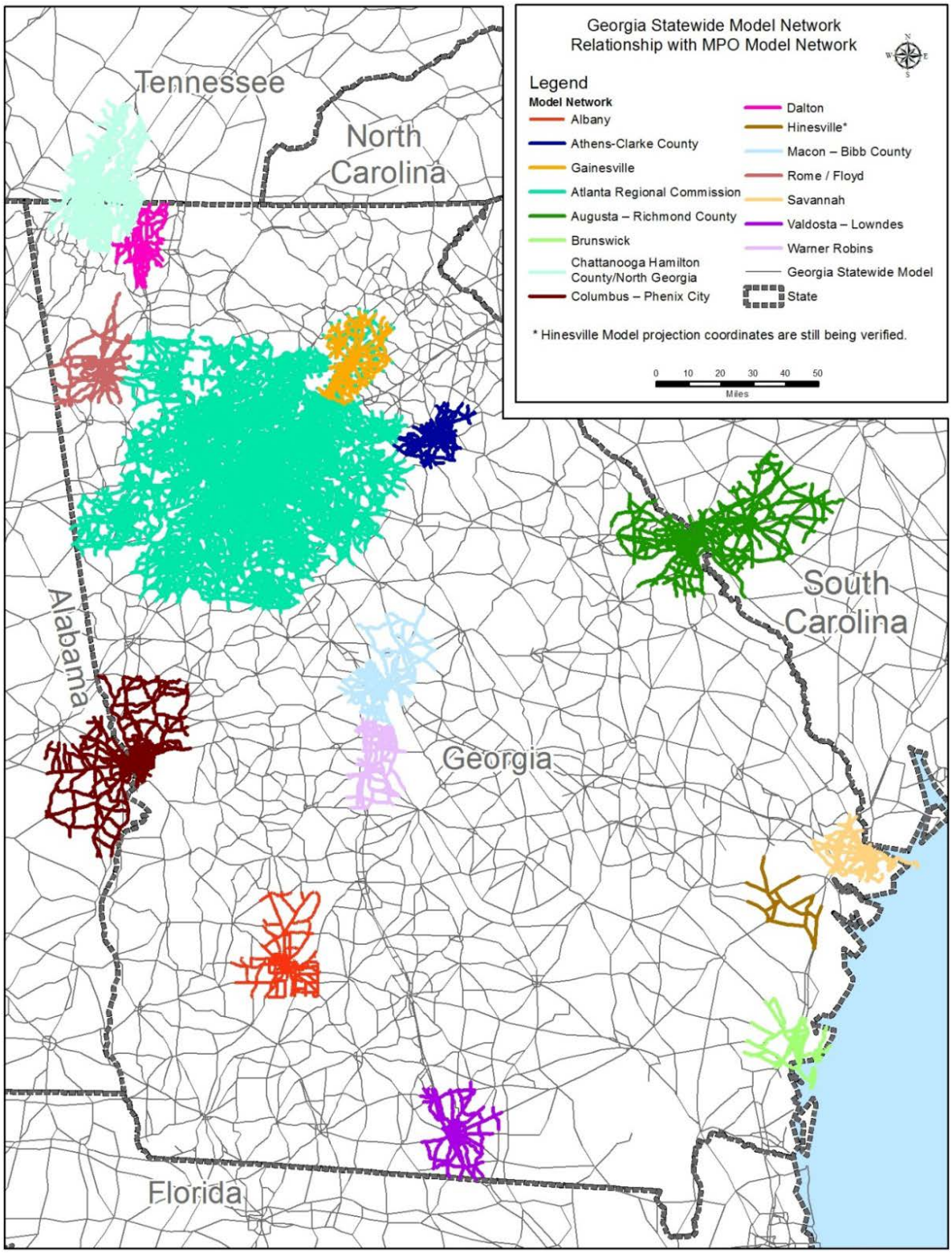
The proposed approach includes use of each MPO model in the State in addition to the SWM. There are 16 MPOs in Georgia, each of which is covered by an urban model with the exception of the recently designated Cartersville-Bartow MPO (not shown on map). The locations of MPO models within the State are depicted in Figure 2 on page 12 and the relationships between the statewide and MPO models are shown in Figure 3 on page 13.

Figure 2. Georgia MPOs



Source: Atlanta Regional Commission, Georgia Association of Metropolitan Planning Organizations. http://www.gampo.org/mpos.htm#north.

Figure 3. Relationship of MPO Models to Georgia Statewide Model



Given that the Georgia SWM includes network links and zones beyond MPO model boundaries, statewide model forecasts are planned to serve as control totals for external trips in the MPO models. The first step in this process will be to review and enhance the validity of the statewide model, particularly on links representing MPO model external zones. Note that some of the MPO models have a 2035 horizon year in which case it will also be necessary to extrapolate socioeconomic data to 2040.

The following steps will be undertaken to determine the applicability of the models to and necessary adjustments for the SWTP/SSTP analysis:

- Check SWM and MPO model base year networks for consistency with each other and with known existing conditions in the 2006 and 2010 base years (depending on the model).
- Check SWM and MPO models for validation performance. Validation checks will include standard items such as the following:
  - Aggregate trip generation statistics like trips per household, employees per household, trips per zone, etc.;
  - Intrazonal trips;
  - Average travel times by purpose;
  - Volume/count ratios; and
  - Percent root mean square error.
- Potential modifications for both the SWM and the MPO models include:
  - Adjust network coding errors (if any); and
  - Adjust centroid connector placing (if necessary to enhance validation).
- Comparison of SWM travel times and paths against those from Google Map to identify any significant differences; and
- Recheck validation results, after modification.

3.2 Transit

The transit data and plans listed in Task II will be reviewed, and as feasible, geocoded data will be mapped. The existing conditions for transit will present summary tables of existing ridership data and corresponding service data for each respective transit agency within the State. Planned and programmed transit projects and programs will also be presented to help with the identification of potential deficiencies and needs as part of Task V. The existing transit conditions will include a review and synthesis of all plans, programs and GIS data from each respective transit provider to present an overall statewide summary. Historical trends since completion of the previous statewide plan will also be noted.

3.3 Rail

For freight rail, the team will summarize the key existing conditions findings from the Georgia F&L Plan. We will also work with the Class I railroads to provide detailed information on the nature of the key bottlenecks identified in the F&L Plan. We will complement the previous work by conducting an analysis of short line railroads operating in Georgia. For each of the short lines, we will develop a description of the assets owned and operated, condition of infrastructure, capital needs, commercial and operational (pricing, switching, interchange, facility use, etc.) agreements with Class I railroads, customers served (when available), commodities handled, volumes moved, and origin-destination patterns. Information will be obtained through a review of publicly available information and a combination of phone and in-person interviews with railroad operators.

For passenger rail, the team will assess current conditions, how effectively the existing system serves the State of Georgia, and identify key issues that affect future development. We will analyze the performance of present operations, including ridership, reliability, travel time, geographic coverage, and schedules. As part of this effort, we will conduct discussions with various stakeholders, including Amtrak and GDOT, the host freight railroads NS and CSX, and review various recently published materials such as the previously mentioned PRIIA route performance improvement studies.

The team will also look at the interaction between freight and potential passenger service to determine where capacity constraints may exist.

3.4 Air

Different source and methods will be used for analyzing the existing conditions for Hartsfield-Jackson Atlanta International Airport (HJAIA) and for the other public airports in Georgia. Existing conditions for HJAIA will be obtained from its 2013 updated Master Plan and Capital Improvement Program (CIP). The existing conditions for the other public airports in Georgia will be obtained from GDOT's *2011 Georgia Statewide Airport Economic Impact Study*, and other available information, including the five-year Capital Improvement Program (CIP) developed by each airport. For the air cargo analysis, the team will provide updated data from the major air cargo airports in the State (Atlanta, Savannah, and Albany). Additional air cargo existing conditions information will be obtained by incorporating work done for the Georgia F&L Plan.

3.5 Water/Freight

The team will describe major freight flows across all freight modes for the State using base year data from the GDOT TRANSEARCH database and forecasts developed from growth rates in the most recently available FHWA Freight Analysis Framework (FAF) database. Information on the ports operated by the GPA will be obtained through work done on the Georgia F&L Plan. Information on the largest private ports will be obtained through publicly available data and interviews of port operators.

3.6 Bicycle/Pedestrian

The bicycle and pedestrian facility information, data and existing plans listed in Task II will be reviewed, and as feasible, geocoded data will be mapped. The bicycle and pedestrian existing conditions will present summary tables of existing facilities, as well as those that are planned and programmed by the State, MPOs, and Regional Commissions through their LRTPs and bicycle and pedestrian plans. Information from the *2010 Georgia Bicycle Map,* which presents roadway volumes and corresponding shoulder widths for roads within the State, will also be utilized. A summary of crash incidents involving bicyclists and pedestrians will be compiled using GDOT's *Georgia Bicycle and Pedestrian Safety Action Plan.* The existing bicycle and pedestrian conditions will include a review and synthesis of all plans, programs, GIS data, and crash analysis results to present an overall statewide summary. Historical trends since completion of the previous statewide plan will also be noted.

4.0 Task IV – Economic and Financial Evaluation and Projection

4.1 Economic Forecasts

The Economic Evaluation and Projection will offer detailed forecasts about the growth trajectories Georgia may take through 2040. The pace and location of Georgia's growth in population, employment, and by industry will influence long-term transportation demand in all modes. The end product will be a new forecast agreed upon by GDOT and the team, of the demographic and economic factors that can be used to update the forecasts contained within the statewide travel demand model to support the future deficiencies' analysis in Task V. Separate state-level forecasts, disaggregated to the county level, will be developed for total population, total employment, and gross domestic product (GDP) by industry.

Inventory, Summary, and Evaluation of Existing State and Regional Forecasts in Georgia

The first step will be to gather current demographic and economic forecasts applied to transportation studies recently completed within Georgia. This step will include forecasts used in the following reports as well as readily available existing forecasts from the U.S. Census Bureau and the Governor's Office:

- 2035 Statewide Transportation Plan;
- Georgia Freight and Logistics Plan (2011);
- REMI model baseline 2011 forecasts from GDOT;
- Economy.com forecast;[1] and
- MPO forecasts.

After completing an inventory of existing forecasts, the team will compare and contrast these forecasts against each other and historical trends. This analysis will include the differences in concepts covered by each forecast, the level of disaggregation across models, and a comparison of magnitude and growth rates for key concepts. U.S. growth rates will be used to provide context and benchmark Georgia's performance, historic and forecast, for each concept. The key differences between the forecasts will be illustrated in a matrix.

Development of a Consensus Forecast for Key Demographic and Economic Concepts

After completing an analysis of the attributes of existing demographic and economic forecasts in Georgia, the team will refine and develop new or revised forecasts for application

[1] Moody's Economy.com is an economic forecasting firm based in Philadelphia, Pennsylvania. The team applied their forecasts to estimate future commodity volumes in the F&L Plan. An updated version will be purchased for this study.

to the statewide model. These forecasts will be developed for population, employment, and Gross Domestic Product (GDP) by industry – all key drivers for the statewide model.

Population

Linked to trip volumes and consumption, population growth has a direct impact on transportation demand. Today, according to the U.S. Census Bureau, Georgia's population increased by 2.1 percent between 2010 and 2012, the ninth highest in the nation, compared to a national average of 1.5 percent. Growth slowed, however, during the Great Recession of 2007 to 2009, but remained higher than the U.S. average. The pace of growth has increased, very recently, as people have become more confident about the sustainability of the national economic recovery and have become more willing to move. For Georgia, it is not yet clear if and when Georgia will return to the higher growth rates experienced prior to the Recession. The U.S. Census Bureau is consistently lowering its national-level long-term growth rates with its recent annual updates.

The development of the new population forecast will be based on an analysis of existing state-level forecasts from the Governor's Office, Economy.com, and REMI. These will be compared to historical growth patterns (e.g., Georgia's rate of population increase by decade and its incrementally increasing share of the U.S. population). Particular scrutiny will be given to how the forecasts have (or have not) adjusted for the recent Recession in both their base year population estimates and long-term growth rates. Through this process, the team will recommend either using an existing forecast or will develop a "SWTP/SSTP Alternative Forecast" for the statewide model. The "Alternative Forecast," if needed, would incorporate changes in long-term growth rates to reflect observed history and the most current national forecast from the U.S. Census Bureau. The justification and the development of a CS alternative will be explained in technical documentation.

After a consensus (either from an existing forecast or the Alternative Forecast) is reached for the state-level population forecast, the team will develop county-level population forecasts to 2040 using the consensus forecast as a control. County or regional population forecasts will be developed based on allocations (i.e., share of Georgia population by county) from the existing REMI, Economy.com, and Governor's Office forecasts. Today, the majority of Georgia's population growth is focused in metropolitan Atlanta, with other counties with growth rates higher than the statewide average dispersed throughout the State. Using the allocations from the existing forecasts, the team will identify any significant disparities in the geographic dispersion of long-term growth in Georgia. The significance of any disparities between the existing forecast allocations, if found, will be shown graphically and explained. If necessary, the disparities will be adjusted by refining the allocations based on trends of historical changes in regional/county share of population.

Employment

Employment growth and the allocation of jobs by region/county will be a determinant of future trip patterns and volumes in Georgia. Jobs forecasts will be available from the 2035 Statewide Transportation Plan, GDOT's REMI model, Economy.com, and the MPOs.

GDOT's REMI model and Economy.com[2] will provide what are likely to be the most current jobs forecasts. A new state-level employment forecast to 2040 will be developed by: 1) analyzing trends in Georgia's historic jobs to population ratios and comparing these to the future ratios extracted from the available forecasts; 2) smoothing the future ratios to align with the historic trend, if needed; and 3) applying a "consensus" forecast of jobs to population ratios to the consensus population forecast. This process will yield a baseline employment forecast to 2040 for Georgia.

Similar to the process used for population, the consensus Georgia employment forecast will be used as a control for distributing jobs to the State's regions and counties through 2040. The allocation will be based on existing forecasts from REMI and Economy.com. Using the allocations from the existing forecasts, the team will identify any significant disparities in the geographic dispersion of long-term jobs growth in Georgia. The significance of any disparities between the existing forecast allocations, if found, will be shown graphically and explained. If necessary, the team will adjust the disparities by refining the allocations based on trends of historical changes in regional/county share of employment.

Gross State Product and Growth by Industry

The pace of Georgia's economic growth, as measured by Gross Domestic Product (GDP), will be a key determinant of transportation demand throughout the forecast period to 2040. Higher economic growth tied to the increased production of goods and services will put greater demand on Georgia's freight infrastructure to support the expansion of manufacturing, trade, agriculture, retail, distribution, and construction activities as well as to meet the State's energy needs.

The Georgia Statewide Freight and Logistics Plan, completed in 2011, included an overall state-level GDP forecast and forecasts by industry based on Economy.com data. These forecasts will be updated for the SWTP/SSTP and will now more fully incorporate the effects of the recent Recession. Economic forecasting became more complex during the Recession because of the difficulty of predicting the end of the economic contractions, the effects on specific industries, and the pace of recovery. Forecasts completed prior to the Recession did not predict the magnitude of the decline (if they predicted it at all) and thus overestimate future long-term growth.

The Georgia GDP and GDP by industry forecasts will be based on Economy.com and the baseline forecasts contained within GDOT's REMI forecasts. Similar to the approach used for population and employment, the existing forecasts will be compared to Georgia's historical economic growth and its share of the U.S. economy. If necessary, the team will refine the GDP growth rates to better reflect the most recent data from the U.S. Department of Commerce's Bureau of Economic Analysis and observed historical relationships between Georgia and the United States. For finer geographic detail, total GDP and GDP by industry for Georgia's regions and counties will be allocated based on the available Economy.com and REMI forecasts.

[2] The purchase of a new Economy.com forecast is assumed in the project budget.

The detailed forecasts will be delivered to GDOT electronically in an Excel spreadsheet format.

4.2 Financial Forecasts

This task will involve the development of a 2040 financial revenue forecast for transportation investment in the State of Georgia. The forecast will be based on current state and Federal funding programs projected into the future. Emphasis will be placed on the FHWA and FTA programs as administered through MAP-21, the two primary Federal funding sources, and the Georgia state motor fuel tax and Georgia General Fund annual transportation allocations. Other funding sources to be examined will include MARTA's sales tax and fare revenue, TIA sales tax, and revenue from managed lanes. In addition, an inventory of local revenue sources and availability will be conducted as a general cross check for local match requirements (of Federal dollars). Local funds may include: Special Purpose Local Option Sales Taxes (SPLOST), Community Improvement District (CID) funds, etc.[3]

Revenue will be projected into the future based on extrapolation of past funding trends, taking into consideration factors such as improved fuel efficiency and increased use of alternative fuels (which will dampen traditional transportation revenue sources), and reasonably anticipated alternative funding sources associated with transportation sales tax revenue or public-private/tolling projects (which will enhance revenue available). A conservative, base case forecast will be developed for use in the Fiscally Constrained plan, and a "best case" forecast will be developed for use in the Unconstrained plan.

A forecasting timeframe from 2015 to 2040 will be used, under the assumption that Federal and state revenue has already been spent or programmed through Fiscal Year (FY) 2014. Base case revenue forecasts will be developed for three programming tiers: 2020, 2030, and 2040. Potential project/program costs will be aligned/constrained within each of these tiers to develop a Fiscally Constrained statewide plan.

Below are the steps necessary to develop the financial/revenue forecasts.

Define Transportation Funding Sources

Federal Funding

Federal funds are a key funding source in Georgia. Federal funds are available through various programs administered by the states for roadway preservation, roadway construction, and other multimodal projects, including, but not limited to, pedestrian, bicycle, and transit facilities and major planning and/or environmental studies.

On July 6, 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law. This new transportation bill, effective on October 1, 2012, replaced the Safe,

[3] For non-NHS Federal Aid eligible roadways owned by a municipality/county, we will assume that local agencies will come up with the required non-Federal match, but will not delve into how they will do so.

Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which was passed in 2005. MAP-21 authorizes over $105 billion of stable transportation funds over FY 2013 and 2014 through a reformed and streamlined funding program structure. The key changes from SAFETEA-LU to MAP-21 are:

- Continued average annual funding is at FY 2012 levels with minor adjustments for inflation;
- Eliminated all earmarks;
- Eliminated most discretionary programs;
- Consolidated SAFETEA-LU funding programs into a much smaller number of broader core programs; and
- Slightly increased Federal transit provisions.

MAP-21 restructured core highway formula programs. Activities carried out under previous formula programs, e.g., the National Highway System Program (NHS), the Interstate Maintenance (IM) Program, the Highway Bridge Program, and the Appalachian Development Highway System Program (ADHS), are incorporated into the following new core formula program structure:

- National Highway Performance Program (NHPP);
- Surface Transportation Program (STP);
- Congestion Mitigation and Air Quality Improvement Program (CMAQ);
- Highway Safety Improvement Program (HSIP);
- Transportation Alternatives;
- Railway-Highway Crossings (set-aside from HSIP);
- State Planning and Research; and
- Metropolitan Planning.

MAP-21's approach to distribution of formula funds is based on the amounts of formula funds each state received under SAFETEA-LU in 2009.

The FTA's transit program has been reorganized into the following categories:

- Urbanized Area Formula Program (5307);
- Rural Areas (5311);
- State of Good Repair Program (5337);
- Bus and Bus Facilities Program (5339); and
- Enhanced Mobility of Senior and Individuals with Disabilities (5310).

State Funding

The primary state revenue sources in Georgia are identified as shown. It should be noted that state funds are also used to cover the required match for Federal funds.

- **Georgia State Motor Fuels Tax –** Funding for a wide variety of transportation projects across the entire State, including major construction projects and maintenance type activities such as resurfacing and signalization upgrades.

- **General Fund Appropriations –** State motor fuel tax revenues have historically fallen short of GDOT's funding needs. GDOT receives annual appropriations from the General Fund to complement its Transportation Trust fund revenue. General Fund allocations are subject to the annual appropriation process. Motor fuel tax receipts are used to pay for debt service, operating and maintenance expenditures (which are not eligible for Federal funding), capital programs, and matching Federal funds. In addition, by state law, motor fuel tax revenues are limited to highway programs and projects.

Local/Other Funding

Most of the State's municipal and county governments use their General Fund comprised of local taxes to conduct routine operations and maintenance of their transportation systems in addition to state aid from gasoline/fuel taxes. However, these jurisdictions also fully fund major construction projects, sidewalks, greenways, bicycle facilities, and required local matches to state or Federal funding programs. Local bond revenue, CIDs and/or Tax Allocation District (TAD) revenue also may be used to fund capital transportation projects. Multiple Georgia counties also take advantage of the local SPLOST programs for funding capital and maintenance projects. In addition, three regions in the State were successful in implementing the recent Regional Transportation Referendum (RTR) sales tax, as enabled by the Transportation Investment Act of 2010 – Central Savannah, Heart of Georgia, and River Valley. These regions began implementing a one percent regional sales tax to fund transportation improvements. Beginning January 1, 2013, funds are being distributed for building projects in early spring 2013, and will be collected over a 10-year period.

Private revenue associated with implementation of the MLSP will also be considered. GDOT is currently revising managed lanes finance options to shift from long-term private concessions to a 55 (fed/state)/45 (toll-back bonds) funding split. Updated revenue and finance assumptions from the MLSP, expected later in 2013, will be used to inform reasonably anticipated managed lanes revenue over the life of the 2040 plan.

Develop Revenue Forecasts

Streets and Highways

In coordination with state and local governments, historical revenue information at current year costs will be obtained. Future revenues will be projected using stable funding sources (programs) and information on the restructuring of Federal funding programs under MAP-21 as shown in Figure 4 on page 24. The step-by-step process is provided below.

Step 1 – Calculate Historic Average Revenue (at Current Year Costs)

Historical revenue averages will be obtained and grouped into Federal, state, and local (where applicable) funding programs. A minimum of five-year time span will be considered, but will be extended if revenue data allows. The average of historic revenues will be calculated and used as the forecasting base averages.

Step 2 – Restructure Federal Funding Programs and Redistribute Base Federal Revenues to Be in Line with MAP-21

Figure 4 maps the SAFETEA-LU funding programs that were historically utilized in Georgia to the new MAP-21 funding structure. Based on the changes from SAFETEA-LU to MAP-21, historical funds will be redistributed into the new MAP-21 funding programs.

Step 3 – Estimate Growth Factors and Forecast Revenue Total by Funding Programs for 2020, 2030, 2040 Tiers

To forecast revenues available under each Federal, state, and local funding program through 2040, a growth rate will be applied to base revenues to reflect average inflation rates over the plan horizon.

Step 4 – Summarize Revenue

Forecasted revenues will be summarized to provide the total available Federal, state, and local revenue for transportation investment within each funding tier (2020, 2030, and 2040).

Note that for purposes of constraining the statewide plan, projected revenue will need to be kept at a disaggregate program level, either Federal, state, or local funding. This will allow the plan to be constrained to the total revenue level within each funding tier and across funding programs.

A second revenue forecast will be developed to support the Unconstrained plan.

Transit

To develop financial revenue projections for transit investment, primary transit funding sources applied in the State of Georgia will be defined. These will include transit funding via the FTA. Under the new MAP-21 transportation bill, FTA funding programs have been restructured from the programs under SAFETEA-LU. Figure 5 on page 25 summarizes the changes from SAFETEA-LU to MAP-21 for Federal transit funding programs.

Figure 4. Changes from SAFETEA-LU Funding Programs to MAP-21 Highway

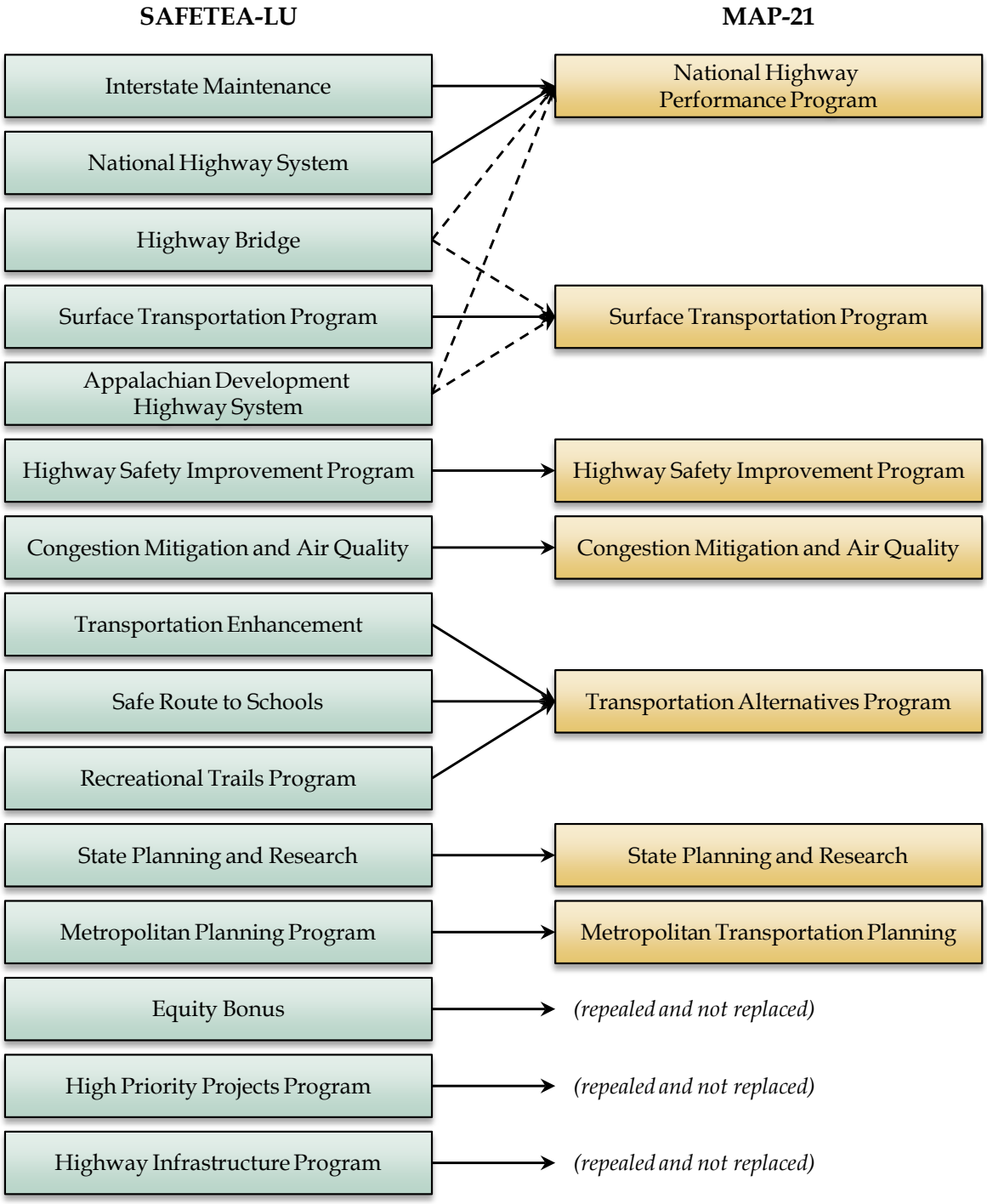
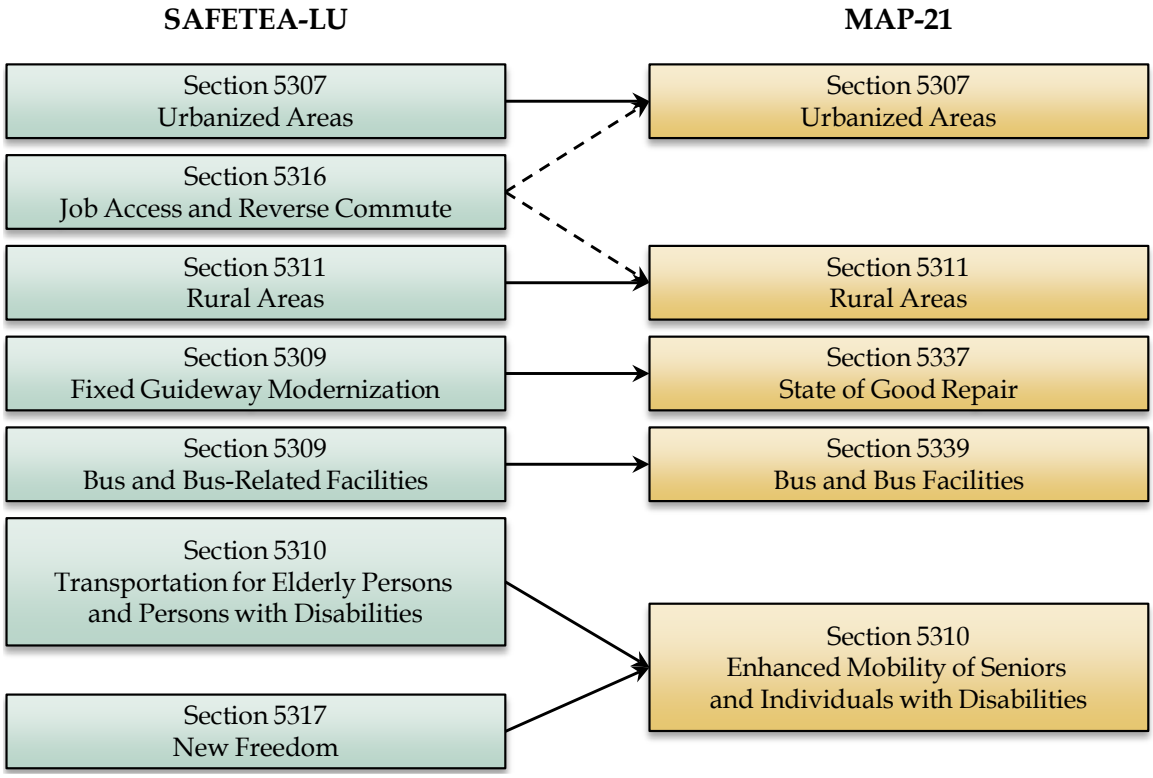


Figure 5. Changes from SAFETEA-LU Funding Programs to MAP-21 Transit



Following the same basic step-by-step approach used in the Streets and Highways revenue projections, historical transit revenues will be obtained for Georgia. The average of (minimum) five years of historical revenues will be used as the base for revenue forecasts. A growth rate will be developed and applied to base state, Federal, and local funding programs. The forecasted transit revenues through 2040 by funding sources will then be allocated to the 2020, 2030, and 2040 Tiers, in support of both the Fiscally Constrained and Unconstrained plans.

Modes Other Than Highway and Transit

Funding for modes such as ports and airports will be determined from the statewide modal plans and/or authority budgets and projections such as for the GPA and Atlanta Hartsfield-Jackson International Airport. Most of this funding comes from independent sources which are off-line to GDOT.

5.0 Task V – Systemwide Evaluation of Deficiencies

The team will identify those elements of the existing transportation system that currently perform below acceptable standards, or are expected to fall below those standards in the future. Building off of the baseline conditions established in Task III, the economic forecasts developed in Task IV, and the future travel demand forecasts developed in Task V below, we will define future No Build, Build, and Unconstrained scenarios. The Build scenarios will include projects that are included in GDOT's Fiscally Constrained program and in MPO Fiscally Constrained LRTPs for projects within MPO boundaries.

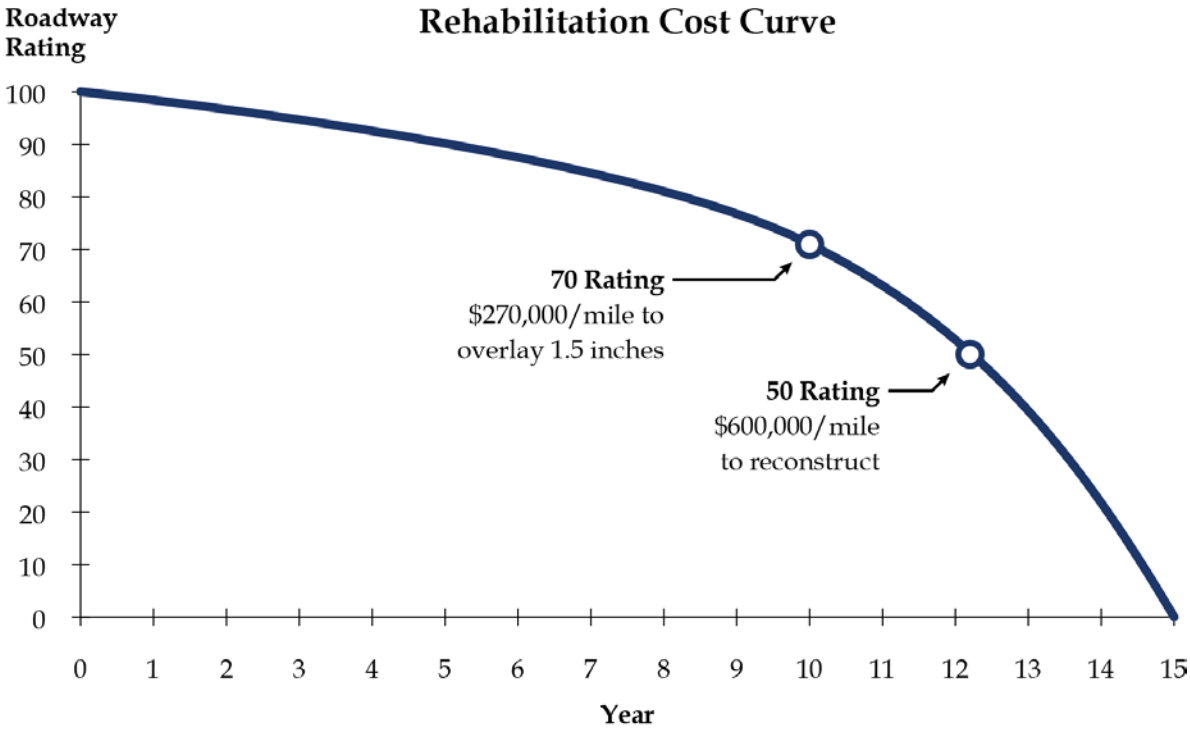
5.1 Highways

The team will utilize the PrPP Performance Measures to evaluate the future deficiencies on the highway system, consistent with the Performance Dashboard under GDOT's Organizational Performance Division and with the requirements of MAP-21. We will evaluate three scenarios: 1) No Build; 2) a Fiscally Constrained Existing and Committed Scenario of projects, and 3) an Unconstrained scenario of projects and programs. The projects and programs for all scenarios will be identified in cooperation with GDOT from those future planned projects identified in an extract of TPro, as identified in the MPO LRTPs, and other projects or programs that might be identified.

For many of the PrPP performance measures that were proposed in Task III, e.g., congestion, the calculations will depend on forecasts from the travel demand models as described below. For some criteria such as preservation it may not be possible to directly forecast Future Highway System deficiencies using GDOT tools. For example, while we hope that COPACES can be used to forecast for a future year, this calculation may not be easily output from COPACES for all of the roads in Georgia. In the event that PrPP performance measures for future years cannot be directly calculated by road segment, we propose to use nationally accepted models to calculate the required values.

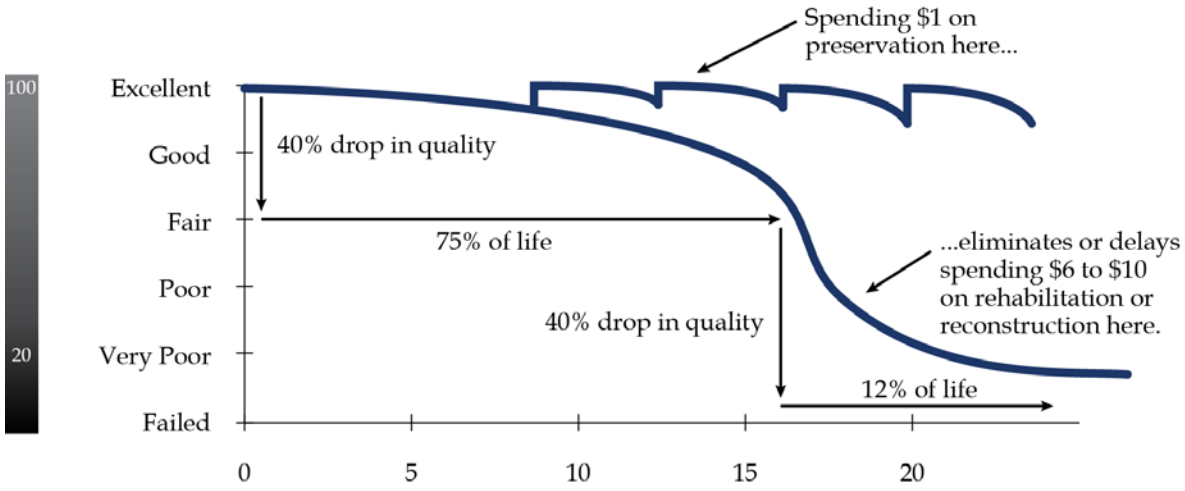
Continuing this example, GDOT's pavement maintenance office does forecast pavement condition over time using PACES (see Figure 6 on page 27). In the event that this process cannot be easily applied to all road segments, the team will use national pavement deterioration models, such as those in the FHWA's Highway Economic Requirements System (HERS) to calculate future pavement condition according to curves such as those shown in Figure 7 on page 27, and to convert the ratings output by those models to a PACES measure, using a crosswalk that can be developed between the different pavement rating systems. Similarly, if GDOT's Bridge Inventory System cannot be used to forecast future conditions on all bridges under different scenarios, the team will use nationally accepted tools such as the National Bridge Investment Analysis System (NBIAS) to make the calculations and convert, as needed, back to the rating system that is used in the PrPP.

Figure 6. PACES Pavement Deterioration



Source: Pavement Preservation in Georgia, GDOT, accessed at:: http://www.pavementpreservation.org/wp-content/uploads/presentations/Georgia%20Pavement%20Preservation.pdf on May 31, 2013.

Figure 7. National Model of Pavement Deterioration



Source: Gordon Proctor & StarIsis Corp. Associates, Inc, Asset Sustainability Index: A Proposed Measure for Long-Term Performance, FHWA, July 2012, accessed at: http://www.fhwa.dot.gov/planning/processes/statewide/practices/asset_sustainability_index/page01.cfm, on June 4, 2013.

There are some PrPP Performance Measures that are not easily forecastable at all, such as crashes in a future year. Crashes are random events that cannot be forecast on individual roads. However the performance measures will be expressed as aggregation of roads, not specific locations, and the team will use the Crash Reduction Factors developed by GDOT as a result of implementing certain projects, to calculate the average crashes on the aggregations of roads that are defined in Task III.

The travel demand models developed in Task III will be used to forecast future congestion deficiencies. Once it is determined in Task III that the base year 2006 SWM validation performance is producing reasonably accurate results, edits made to the base year will be applied to forecast years for consistency purposes. This effort will be completed by use of geographic spatial techniques such as depicting an exported base year shape file directly behind the SWM Existing-Plus-Committed (E+C) network and making corrections where the model networks appear inconsistent in terms of network alignment. Particular attention will be paid to centroids and centroid connectors. Observed base year network coding errors will also be corrected in the E+C network, where applicable.

Once SWM E+C network edits are completed, it will be necessary to adjust all models to the 2040 horizon year. MPO model E+C network edits will also be required where validation/ correction adjustments were made in the MPO base year networks. Linear extrapolation of MPO model demographic and external input data to 2040 will be required where the existing MPO model horizon year is 2035. Where the MPO model has a 2040 horizon year, no growth extrapolations will be required. The SWM already has a horizon year of 2040.

Comparisons will then be made between statewide model link forecasts and MPO model external forecasts at common locations. While SWM forecasts are generally assumed to be the more reliable source for link locations along MPO boundaries, MPO model forecasts will not be adjusted in cases where the statewide model validates poorly in base year 2006. Where readily available, historic traffic counts can also be used to assess the more reliable forecasts when MPO and SWM models differ considerably.

The aforementioned E+C networks (SWM and MPO) will serve as the starting point for coding all future year networks used in alternatives testing. The future network alternatives will include:

- Committed projects, including Transportation Investment Act (TIA) projects that were passed in 2012 and are within the E+C planning horizon;
- TIA projects outside of the E+C planning horizon; and
- Other MPO and statewide projects to be included in the Unconstrained plan.

A 2040 deficiency analysis will be conducted to identify potential level-of-service (LOS) deficiencies on the Georgia state highway system. Highway segments with a volume-over-capacity (v/c) ratio of 0.75-1.00 will be flagged as borderline deficient while segments with v/c ratios greater than 1.00 will be flagged as deficient. For roadway segments inside MPO boundaries, MPO model forecasts will be used while the statewide model will be used to identify deficiencies outside of MPO model boundaries. Alternate approaches to identify

deficiencies or modified v/c ranges can be considered based on discussions with GDOT staff.

Once alternatives have been coded, checked to ensure consistency, and deemed suitable for planning use, each alternative will be run with a range of socioeconomic assumptions regarding population and freight economic activity as developed in Task IV. Results to be reported include activity data like vehicle miles traveled, vehicle hours traveled, corridor travel times and speeds, and truck activity. Vehicle system hours of delay for autos and trucks will also be reported. The modeling outputs will then be used as inputs to any post processing regarding ITS, air quality analysis, or other secondary metrics required for the plan.

5.2 Transit

The transit data existing conditions presented in Task III will be reviewed and assessed. For urban transit, the No Build scenario will assume continuation of the existing level of transit service, including capital, and operating and maintenance expenditures. The Build/ Financially Constrained scenario for urban transit will assume continuation of the existing level of transit service supplemented by service expansions included in each MPO's LRTP. The Unconstrained scenario will include unfunded elements from the MPO LRTPs. For rural transit service (generally demand responsive service), the No Build scenario will also assume continuation of the existing level of transit service. The Build/Financially Constrained scenario for rural transit will assume continuation of the existing level of transit service supplemented by service expansions that keep up with population growth. The Unconstrained scenario will assume expansion of rural transit to all non-urbanized counties and increasing existing transit service to maintain the current statewide average rate of service per capita, assuming regional growth factors warrant this expansion.

5.3 Rail

For freight rail, the team will develop detailed information on the key freight rail bottlenecks in the State based on the freight rail work conducted in Tasks II and III. We will also identify short line railroad needs based on the short line railroad analysis conducted in Task III. Drawing on the work completed in the previous tasks, we will assess how well the existing and planned passenger rail services may be able to accommodate future demand. Particular emphasis will be placed on critical issues such as line capacity, condition, capacity, and location of passenger stations (such as the Atlanta multimodal terminal project), rolling stock, and other operational aspects. The team will also examine future passenger train operations in the context of the recently completed Georgia High Speed Rail Study, the ongoing Southeast High-Speed Rail project, and GDOT's ongoing Atlanta to Charlotte Passenger Rail Investment Plan, scheduled to be complete in mid-2015,. None of these potential future passenger rail projects have committed funding. At a high level, the team will discuss the programmatic impacts of funding passenger rail projects under a Fiscally Constrained scenario. Under the Unconstrained scenario, we will describe alternative funding sources for passenger rail, as identified in the existing studies.

For rail and other modes, Fiscally Constrained and Unconstrained plans will be developed on a case-by-case basis using the best available information from the responsible agencies.

5.4 Air

Needs and deficiencies for Hartsfield-Jackson International Airport (HJAIA) will be summarized as presented in its 2013 updated Master Plan and Capital Improvement Program (CIP), since no state money or grants are given to HJAIA. Needs and deficiencies identified for the other public airports in Georgia will be obtained from GDOT's *2011 Georgia Statewide Airport Economic Impact Study*, and potential updates to GDOT's 2003 Georgia Aviation System Plan (GASP), and their Master Plans and CIPs. The air cargo deficiencies will be identified by incorporating the air cargo work conducted in the Georgia F&L Plan.

5.5 Water/Freight

The team will identify freight-related deficiencies based on the work conducted in the F&L Plan. This work will be updated by analyzing the deficiencies implied through the new data collected in Task II and the freight system conditions updated in Task III. We will also reconvene the Private Sector Advisory Committee from the F&L Plan to review and comment on the deficiencies as identified in the SWTP/SSTP.

5.6 Bicycle/Pedestrian

Bicycle and pedestrian needs and deficiencies will be developed primarily utilizing existing local plans, including the MPO LRTPs, MPO bicycle and pedestrian plans, and Regional Commission bicycle and pedestrian plans. Crash analysis results from GDOT's *Georgia Bicycle and Pedestrian Safety Action Plan*, in combination with the *2010 Georgia Official Bicycle Map*, will be reviewed against local planned projects to develop the comprehensive statewide list of needs and deficiencies.

5.7 Tradeoff Analysis

A funding "tradeoff" analysis will be conducted to help identify optimal funding levels across various transportation investment programs considered as part of the 2040 SWTP/SSTP. Programs, in this case, refer to groupings of similar types of investments strategies, and the allocation of funds at this step is intended to be a critical first link between stated plan policy and actual plan development. For example, a "preservation first" policy would dictate a heavier funding distribution to preservation programs, such as bridge and pavement maintenance.

Transportation needs in Georgia greatly outweigh expected revenues based on the work documented in the 2005-2035 SWTP and in the 2010-2030 SSTP. Therefore, a key part of the planning process is to determine how best to allocate the limited funds for the Fiscally Constrained and Unconstrained programs. For example, how much money should be spent on preserving the existing transportation network versus expanding it? Or within the preservation program, how much should be allocated to pavement needs versus bridge needs? All transportation agencies face these types of tough decisions. Most agencies

address them through a combination of historic precedent and/or ad hoc policy development. In contrast, during the 2040 SWTP/SSTP update, a structured funding tradeoff analysis will be conducted to inform how funds are allocated across various investment areas. Tradeoff analysis will provide a data-driven, transparent, and structured process for exploring potential investment scenarios. In this context, a "scenario" is defined as a set of policy and programmatic funding levels and associated performance levels. Tradeoff analysis will enable GDOT to better understand the implications of potential funding scenarios, starting with the funding projections developed in Task V. The end result will be a set of funding levels by program type through 2040 and a set of performance levels that can be achieved with these amounts. This work will also serve as a foundation for setting objective and transparent performance targets for national transportation goal areas, as required by MAP-21.

A spreadsheet-based tradeoff tool will be developed and applied to enable GDOT to game plan "what if" scenarios assuming different overall levels of funding (Fiscally Constrained versus Unconstrained) and allocations of funding across modes, programs within modes, and major projects. The results of this tradeoff analysis will be used to inform the programmatic recommendations in Task VI.

The steps associated with the funding tradeoff analysis are defined below.

- **Define Tradeoff Decisions that Reflect Major Policy Choices for the SWTP/SSTP Update –** A small set of tradeoff decisions will be defined that reflect the major policy choices considered as part of the Plan update. Examples might include preserving the existing system versus expanding it, and/or funding the Interstate Highway System versus other parts of the National Highway System (NHS), and cross-modal comparisons where appropriate.

- **Update Analysis in GDOT's Existing Tradeoff Tool –** The funding tradeoff analysis will leverage and expand to all modes the existing tool developed for GDOT's Strategic Plan and Asset Management Implementation Study. The tradeoff tool currently enables GDOT to explore options for allocating money among five program areas – pavement, bridge, capacity, operations, and safety. Users can define scenarios by specifying a total budget or program-specific budgets, and view the expected future performance. For example, the tool enables GDOT to determine how shifting $100 million from pavement maintenance to capacity projects would impact both the performance of the pavement using the COPACES system and the number of hours of traffic delay across the State. This tool also can be used in meetings with GDOT's stakeholders to quickly provide information on how the funding of alternative program areas impacts the actual experience of Georgians using the transportation system.

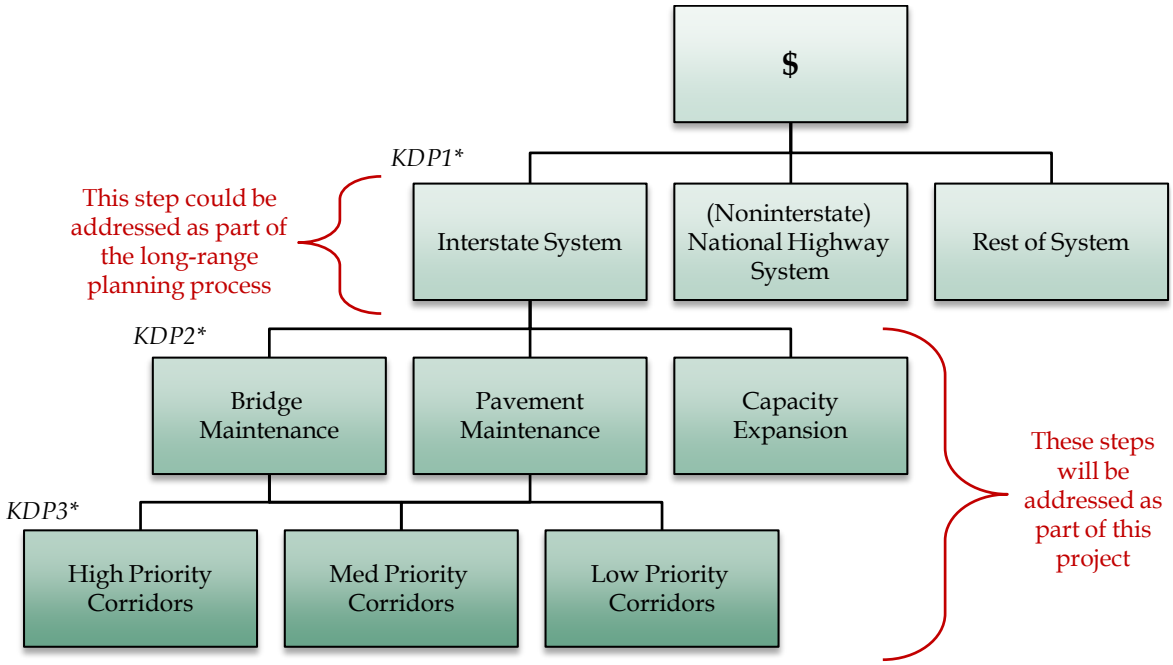
  As part of this step, all funding and performance information developed as part of GDOT's ongoing Georgia Interstate Risk Assessment Plan will be incorporated. As part of the ISP, a more focused tradeoff analysis will be conducted to inform preservation funding levels across maintenance investment programs (pavement and bridge) and across Interstate corridors. This effort will be folded into the broader multimodal

tradeoff analysis to be performed as part of the SWTP/SSTP update as shown in Figure 8 on page 32.

- **Define Funding Scenarios –** These funding scenarios will represent options for allocating funds among the program areas. Scenarios will align with either Fiscally Constrained revenue projections or Unconstrained revenue projections.

- **Vet the Scenario Results and Select the Preferred Scenarios –** This process often requires multiple iterations where decision-makers view and discuss the scenarios, and then define new ones for further investigation. The primary objective is to gain consensus around a general, preferred, and optimal funding allocation across key program/investment areas. While selection of a preferred alternative will not dictate exact funding allocations to program areas, it will provide a strategic and clear funding policy direction for the SWTP/SSTP.

Figure 8. Resource Allocation Framework for the Interstate System Preservation Plan
February 1, 2013, ISP Project Meeting



* Key Decision Point.

6.0 Task VI – Recommendations

- The team will develop a Fiscally Constrained transportation plan to become the SWTP/ SSTP based on projected available funding as forecast in Task V, and the Tradeoff Analysis conducted in Task V. This recommendation will include programmatic investment levels (i.e., by mode, and by major investment category within modes, such as for highways, bridge, pavement, capacity expansion, safety, etc.), and for a limited number of major investment projects.

- The team will develop an Unconstrained funding scenario to meet needs in excess of currently projected funding levels (using the "best case" funding level in Task IV), and using the Tradeoff Analysis in Task V. Develop recommendations for obtaining the additional funding needed to meet these needs.

7.0 Task VII – Public and Stakeholder Engagement

The methodology for this task will be separately documented in a Public and Stakeholder Engagement Coordination Plan, which will be incorporated into the Study Methodology by reference. In accordance with 23 CFR 450.212, public engagement is an important component of the SWTP. The purpose of this task is to assure that appropriate coordination with the public is provided throughout the study process and that the public has opportunities to engage in the analysis process and the development of recommendations. The involvement process will be continuous in the development of the SWTP/SSTP Plan. Comments will be received through the plan update web site, housed on GDOT's external page, by phone, or by email, and responded to in a timely manner.

This Plan will include the following elements:

- Public and Stakeholder Outreach Database;
- Public Meetings (four rounds);
- Fact Sheets and Press Releases;
- Special Citizen and Environmental Justice Outreach;
- Public and Stakeholder On-Line Survey, Smartphone Link, and Summary;
- Consultation with Local Government Officials;
- Stakeholder Advisory Committee;
- Rural Focus Groups (four);
- Public and Stakeholder Engagement Summary Report; and
- Web Site.

8.0 Task VIII – Final Report

The Final Report will meet the requirements of state and Federal law regarding a statewide transportation plan and a state strategic transportation plan. It will document the SWTP/ SSTP development activities, findings, and conclusions. The report will be multimodal and financially constrained. It will include an Executive Summary which can be published as a stand-alone document. The report will describe the analytical process in ways that are understandable and meaningful to both lay and technical audiences. The report should combine the elements of the previously separately developed SWTP and SSTP.

The report will include the following sections:

- Executive Summary.
- Plan goals, objectives, scope.
- Strategic investment priorities and the business case for transportation investment:
  - Programmatic priorities; and
  - Large stand-alone projects.
- Previous deliverables.
- Significant changes from previous plans.
- Existing conditions.
- Economic and financial forecasts.
- Projected future conditions.
- Recommendations (including 10-year elements, and long-range elements for each):
  - Financially Constrained program; and
  - Unconstrained program with funding recommendations.
- Conclusions.
- Definitions.
- References.
- Task Technical Reports, included as an Appendix by reference.

9.0 Task IX – Project Management

The details of project management are outlined in a separate Project Management Report. Note that all task deliverables are listed in the Project Management Report.